

What is claimed is:

1. A method of cleansing a gas stream in a pollution control system, said gas stream having entrained particles, comprising:

scrubbing the gas stream to remove a substantial proportion of the large particles by contacting liquid droplets with said gas stream in a low-energy venturi scrubber, coalescing said droplets, and removing the coalesced droplets containing said large particles from the pollution control system; and

thereafter, scrubbing the gas stream to remove the remaining finer particles entrained in the gas stream.

2. The method of Claim 1, further including contacting liquid droplets with said gas stream by spraying said liquid into said gas stream.

3. The method of Claim 1, wherein said liquid droplets comprise water and have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

4. The method of Claim 1, wherein said first scrubbing step has pressure drop from about 1" H₂O to about 10" H₂O.

5. The method of claim 1, wherein said large particles have a aerodynamic diameter of greater than about 2 micrometers.

6. The method of Claim 2, wherein said spraying further includes providing water to a nozzle within said gas stream, and wherein said liquid droplets have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

7. The method of Claim 1, wherein said second scrubbing step includes contacting said gas stream with a second scrubbing liquid, wherein said coalesced drops of said first scrubbing step are disposed of, and wherein said second scrubbing liquid is recycled in said air pollution control system.

8. The method of Claim 1, wherein said first scrubbing step has a first pressure drop, wherein said second scrubbing step has a second pressure drop, and wherein said first pressure drop is less than said second pressure drop.

9. A method of cleansing a gas stream in a pollution control system, said gas stream having entrained particles, comprising:

scrubbing the gas stream to remove a substantial proportion of the large particles by contacting liquid droplets with said gas stream in a venturi scrubber, coalescing said droplets, and removing the coalesced droplets containing said large particles from the pollution control system,

where said scrubbing occurs with a pressure drop; and

thereafter, scrubbing the gas stream in a venturi scrubber to remove the remaining finer particles entrained in the gas stream, wherein said scrubbing occurs with a pressure drop;

wherein the first scrubbing step is performed at a lower pressure drop than the second scrubbing step.

10. The method of Claim 9, further including contacting liquid droplets with said gas stream by spraying said liquid into said gas stream.

11. The method of Claim 9, wherein said liquid droplets comprise water and have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

12. The method of Claim 9, wherein said pressure drop of said first scrubbing step is from about 1" H₂O to about 10" H₂O.

13. The method of Claim 9, wherein said large particles have a aerodynamic diameter of greater than about 2 micrometers.

14. The method of Claim 10, wherein said spraying further includes providing water to a nozzle within said gas stream, and wherein said liquid droplets have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

15. The method of Claim 9, wherein said second scrubbing step includes contacting said gas stream with a second scrubbing liquid, wherein said coalesced drops of said first scrubbing step are disposed of, and wherein said second scrubbing liquid is recycled in said air pollution control system.

16. A method of pre-treating a gas stream having entrained particles in a pollution control system, where said pre-treating removes a substantial proportion of entrained large particles from said gas stream prior to treating the gas stream to remove the remaining entrained finer particles, comprising:

scrubbing the gas stream in a low-energy venturi scrubber to remove a substantial proportion of the large particles by contacting liquid droplets with said gas stream, coalescing said droplets, and removing the coalesced droplets containing said particles from the pollution control system.

17. The method of Claim 16, further including contacting liquid droplets with said gas stream by spraying said liquid into said gas stream.

18. The method of Claim 16, wherein said liquid droplets are water and have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

19. The method of Claim 16, wherein said pressure drop of said scrubbing step is from about 1" H₂O to about 10" H₂O.

20. The method of Claim 16, wherein said large particles have a aerodynamic diameter of greater than about 2 micrometers.

21. The method of Claim 17, wherein said spraying further includes providing water to a nozzle within said gas stream, where said liquid droplets have a mean mass diameter of from about 200 micrometers to about 750 micrometers.

22. The method of Claim 17, wherein said coalesced drops are disposed of.
wherein the scrubbing step is performed at a substantially lower pressure drop than the treating step.

23. An air pollution control system for removing entrained particles from a gas stream comprising:

a first scrubber to removes a substantial proportion of particles having a aerodynamic diameter of greater than about 2 micrometers, said first scrubber having

a venturi scrubber with a gas stream pressure drop of from about 1" H₂O to about 10" H₂O, and

a droplet generator to inject droplets into the gas stream, where said droplets are water with a mean mass diameter of from about 200 micrometers to about 750 micrometers, and

a droplet separator to accept the gas stream and said water droplets from said venturi scrubber and remove said droplets from the gas stream; and

a second scrubber to remove a substantial proportion of the particles not scrubbed from the gas stream from said first scrubber.